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Present-Day Gardening

**NEW YORK STATE
COLLEGE OF AGRICULTURE
DEPARTMENT OF FLORICULTURE
AND
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CORNELL UNIVERSITY
ITHACA, N. Y.**

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MANAGING EDITOR
OF THE *GARDENERS'*
CHRONICLE.**

**A LIST OF VOLUMES
IN THE SERIES IS
GIVEN ON THE NEXT
PAGE.**

Present-Day Gardening

List of Volumes in the Series.

1. SWEET PEAS. By HORACE J. WRIGHT, late Secretary and Chairman of the National Sweet Pea Society. With Chapter on "Sweet Peas for Exhibition" by THOS. STEVENSON.
2. PANSIES, VIOLAS, AND VIOLETS. By WILLIAM CUTHEBERTSON, J.P., and R. HOOPER PEARSON.
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PLATE I (*Frontispiece*)

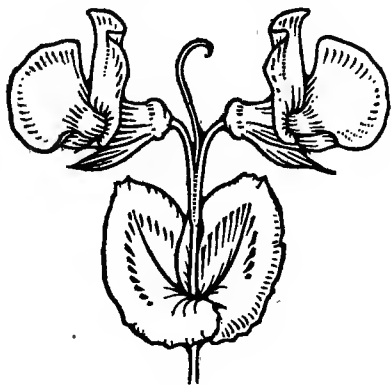
FIFTEEN VARIETIES SHOWING VARIATION IN
COLOUR AND FORM



Sweet Peas

By Horace J. Wright

*With Eight Coloured
Plates*



*London: J. C. & E. C. Jack
67 Long Acre, W.C., & Edinburgh*

P R E F A C E

ONE of the most remarkable facts in relation to present-day flower gardening is the development and popularisation of the Sweet Pea, which has gained for itself a position never previously held by a purely annual species. The claim of the Sweet Pea, therefore, for representation in the present series could not be overlooked.

The author, Mr. Horace J. Wright, is well known as the first secretary of the National Sweet Pea Society, and later as Chairman of the General and Executive Committees of that body. He has been connected most intimately with all the circumstances which have attended the development of the flower; therefore his experience is exceptional. It is this very experience which induced Mr. Wright to ask Mr. Thomas Stevenson to contribute a chapter on the special culture needed for exhibition flowers, for Mr. Wright's management of the N.S.P.S. exhibitions has impressed him with the value, in exhibition culture, of small details to which other cultivators need pay but little regard. Mr. Stevenson's extraordinary successes at the competitive exhibitions should

make his advice invaluable to those who desire to emulate his example.

Acknowledgments are made to Messrs. Dobbie and Co., who very kindly provided the flowers photographed in the plates. All the varieties are shown very much reduced in size.

THE EDITOR.

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SWEET PEAS

INTRODUCTION

THE Sweet Pea is the first garden flower of the present day. It is found abundantly in the unpretentious garden of the cottager, the less simple garden of the amateur, the smart garden of villadom, and the elaborate and extensive gardens of the opulent and noble. In the restricted areas called town gardens the Sweet Pea has its place, just as it has in the more congenial gardens attached to rural homes. The plants will not flourish with the same excellence in the enclosed garden as in those which get the benefit of pure country air, but they will nevertheless yield a generous return in any circumstances for the labour and love bestowed upon them.

Whether the particular object of culture is to decorate the garden, provide flowers for brightening and giving fragrance to the house, or entirely for the purpose of getting flowers for the exhibitions, the Sweet Pea will rarely, if ever, disappoint the cultivator. Wherever the atmosphere is moderately free from impurities, the plants will thrive

CHAPTER I

HISTORICAL NOTES

It is not intended to place on record here an exhaustive history of the Sweet Pea. Instead of doing this, the salient facts alone will be brought into view, and we shall then gradually come to see that although the plant has been grown in this country for upwards of two hundred years, to all intents and purposes its history, as far as the practical man is concerned, has been made in the last half-century. However, let us to the start.

In the year 1699 there dwelt in Sicily a monk named Cupani. In his spare time this holy man studied the flora of that beautiful island, and this flora included the Sweet Pea. Not that he gave it that name. When he sent seeds to his English correspondent, Dr. Uvedale, in those days a schoolmaster at Enfield in Middlesex, the unwieldy cognomen—or ought one to say descriptive title?—was *Lathyrus distoplatyphyllos, hirsutis, mollis, magno et peramæno, flore odoratissimo, purpureo*. If we were required to call the Sweet Pea by this name in these days of hurry and scurry the flower would lose half its charm.

Although these are the circumstances which attended the introduction of the Sweet Pea into Great Britain, the plant had already been referred to in botanical works, for Mr. S. B. Dicks, who searched wide and long to compile the early history of the flower for the Bicentenary Celebration Festival, found it mentioned in the *Historiæ Plantarum* of Johannes Bauhinus, dated 1650-51. Robert Morrison of London mentions a *Lathyrus latifolius annuus* in 1669, but this differed from the fragrant Sicilian flower. John Ray, also of London, alluded to it as *Lathyrus major e Sicilia* in his *Historia Plantarum*, published between 1686 and 1704. In addition to the seeds which Cupani forwarded to Dr. Uvedale, he sent some to Casper Commelin, and what was, apparently, the first illustration, was prepared from flowers grown from these seeds. This picture appeared in the *Horti-Medici Amstelodamensis*. Subsequently Joannis Burmannis, in 1737, described *Lathyrus Zeylanicus*, and spoke of it as differing only from the *Lathyrus* of Cupani in the variety of the flower. Further experience proved that they were one and the same species, and from that species all modern Sweet Peas have been derived.

Even in those days the flower was found to be variable, and it is possible that if the florists had not purposely selected and fixed the old-fashioned varieties with smooth and hooded standards, we should never have worried about

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the Sweet Pea made the name of Eckford as music to the ears of all who love flowers.

His first great success was Bronze Prince, but he had not then learned all there was to be learned in regard to fixity. The variety was so inconstant that it failed to retain its popularity for so long a period as it should have done, for in all other respects the flower was excellent. Once on the high road, Henry Eckford never left it. Year after year fresh novelties were obtained, the earliest ones being distributed by others and the later ones by himself ; for he left private service at length and established himself in business at Wem in Shropshire. Each novelty had some marked superiority over its predecessors, and so careful was the great florist that, after one or two early mistakes, he distributed only such varieties as were perfectly fixed.

Slight variations occurred in the named varieties from time to time, but they were only such as were to be expected in a flower exclusively propagated from seeds, and produced by cross-fertilisation based on no clearly defined lines. Now the raisers have Mendel's laws of inheritance to guide them, and they should be able to produce some wonderful results ; but whatever is done, the name of Henry Eckford will stand for ever above all other names in connection with the development of the Sweet Pea. The Eckfordian varieties showed advancement in substance, size, form, fragrance, and colour, for it seemed to be a point of

honour that no one attribute should be exploited at the expense of others.

With the institution of the National Sweet Pea Society in 1900 many other raisers came into prominence, and they have done excellent work since that time. Novelties succeeded novelties in unbroken sequence, and while some were given names to which they were not entitled, being insufficiently distinct from others, or lacking good qualities themselves, the majority merited the popularity to which they attained.

Eckford and his contemporaries achieved wonders, but all their varieties had smooth or hooded standards, therefore when Silas Cole, gardener to Earl Spencer, Althorp Park, Northampton, showed a shell-pink variety with waved standards and wings, at an exhibition at the Royal Aquarium in 1901, the Sweet Pea world simply lost its head in amazement. Here, indeed, was something different from, and infinitely more beautiful than, anything that had yet been seen. Silas Cole was worried nearly out of his life for seeds, but eventually the stock passed into the hands of Robert Sydenham, who, in response to persistent agitation, was induced to distribute the variety before it had been properly fixed, and it was that error which has led us into so many pitfalls since. Had Countess Spencer been properly fixed prior to distribution, it is well within the bounds of possibility that the trueness that had come,

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smoothness of the unbroken roundness was destroyed. This defect occurs even in recent varieties, and it detracts from their charm.

Notwithstanding these differences, it is safe to describe the many varieties as all belonging to the earliest or smooth-standard group, now commonly called, for the sake of distinction, the *grandiflora* division. The hooding and the reflexing were merely indications of some inherent weakness of the variety, and could by no means be claimed to constitute sufficient difference to justify the creation of a distinguishing section.

These prevailed until Countess Spencer was first shown only nine years ago. In this break away from the normal, not only was the form of the flower totally distinct, but there was a structural variation of immense importance, since it was well within the bounds of possibility that it would affect the constancy of the variety or varieties. The difference of form was all for the better. The rigid outline of the smooth standard was broken, and we had a bloom in which the standards were waved in an elegant and attractive manner and the wings showed the same exquisite characteristic, and the flower became popular even before it was generally known, so enthusiastic were contemporary writers in their comments and praises.

In one respect this group shows some inferiority in comparison with the old, smooth flowers. When the

PLATE II
HELEN LEWIS



plants are cultivated on over-rich land, this graceful waviness, which all admire, becomes an ungainly floppiness that completely spoils the bloom; an overfed, smooth flower might appear slightly coarse, but it never assumed such an aspect as the waved standards in similar circumstances. The remedy is, of course, obvious. Do not so unintelligently manure the soil, and subsequently feed the plants, that they will produce flowers that have these defects, which are sufficient to ruin the plants as well when grown for garden embellishment as for exhibition.

Turning now to the structural difference, it has been said already that when the keel closely enclosed the essential organs, this circumstance reduced to a minimum the probabilities of natural agencies stepping in and causing cross-fertilisation. In the Spencer group, to which attention is now being directed, the segments of the keel expand and the organs protrude. This characteristic constitutes the distinguishing feature of the varieties as compared with those of the Unwin type, to which reference will be made in due course.

Good judges differ as to whether this peculiarity has or has not affected the stability of varieties. Certain it is that, despite all the efforts which have been made, perfect fixation of these varieties is still a more or less doubtful quantity. On the contrary, there are some varieties which are absolutely of Spencer form that have scarcely varied in

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the smallest degree since they were first distributed. The little differences that have occurred have been on all-fours with those that characterised the smooth-standard group half a century or more ago. There are those who affirm that the fact of the seed of Countess Spencer having been originally grown in bulk in California was the whole and sole cause of its unreliability ; but there cannot be much in this argument, for other varieties which have also been grown there are true to all intents and purposes.

It is on record that Henry Eckford devoted several years to the fixation of smooth-standard varieties before introducing them, and that Messrs. Sutton had their variety Butterfly in the nurseries for many seasons before they put it into commerce; simply because they could not get it to remain constant ; and other raisers have had similar experience. Thus the conclusion is almost forced upon us that had Countess Spencer been held back for a period it would have saved all the trouble. Countess Spencer was a seminal variation from Prima Donna.

Some varieties that were notoriously bad when first sent out have been enormously improved, but there are others, and Audrey Crier may be mentioned as a well-known example, which it appears impossible to persuade to come true, or even to improve. Although this variety has been selected and re-selected year after year, it is as unreliable as ever, and must never be expected to yield

more than 10 per cent. true, whereas many sorts will give anything from 90 to 100 per cent. of trueness.

The third group is composed of the Unwin varieties. The first appeared in the same year as Countess Spencer, and was selected by Mr. Unwin. The difference between it and the smooth-standard section is that the standard and wings are almost as much, and quite as gracefully, waved as those of the more highly esteemed Spencers. The group differs from the Spencers in that it has the keel quite closed, as in the old form. The group therefore comes midway between the other two groups, and had it been placed on the market before Countess Spencer and come as true then as it does now, it would have enjoyed the greater popularity; but it was held back for fixation, and when this quality was secured the supremacy of the Spencer type was assured. The typical variety is Gladys Unwin, which in its day was more extensively grown for cut flowers for market than any other variety had ever been, and the British market grower knows a good thing and will not grow a bad one.

There are many growers of Sweet Peas who would willingly forgo a little as regards colour, and perhaps waviness, provided that they could feel assured of fixation, and to these cultivators the Unwin group can be strongly recommended. It must be understood, in relation to this, that the trueness of Unwin, as well as other varieties in the two waved groups, is not by any means guaranteed, but simply

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that the chances are substantially in favour of securing a higher percentage of trueness, taking one variety with another, not allowing the insufficient evidence or experience of one season positively to decide the matter with the Unwin group, any more than with the true Spencers.

An effort is being made in some directions to separate these two groups for purposes of exhibition, but the expediency of doing so is much open to question, and it would certainly place a serious responsibility upon the judges, since it would involve them in the necessity of closely examining every flower; for, apart from the difference of the keel, there is no other distinguishing feature which can be taken as a guide. An exceptionally intimate knowledge of the varieties would be helpful, but there are few who would lay claim to being absolutely certain of any variety other than the specialist growers who work for the principal raisers.

CHAPTER III

MAKING NEW VARIETIES

WE have advanced so far in the development of Sweet Peas, that it may be thought there is now no ideal to inspire future raisers. This is far from being the truth. As a purely elementary illustration, it may be pointed out that we have not yet got the true yellow or the true blue flower. Nothing short of the hue of *Coreopsis grandiflora* will satisfy the world in regard to the former ; while as for the latter, we have in our mind the blue of *Salvia patens*. There must be no hint that there is nothing left to do, so long as we have not these delightful colours !

When, then, shall we have them ? Here is a question which is easy enough to propound, but impossible to answer. The Sweet-Pea-loving public may accept it as an indisputable fact that modern raisers will spare neither trouble, skill, patience, nor money to achieve these objects, for they know perfectly well that those who are successful will not only reap a rich financial reward, but that their name or names will go down to posterity with that of Eckford in the cult of the Queen of Annuals.

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Systematic work on clearly defined lines, and with definite objects in view, is constantly proceeding, as well in the ranks of amateurs as among professional growers, and there is no apparent reason why any one of the former class should not achieve as good results as a member of the latter class, provided that the same care, thought, intelligence, and complete understanding of the task before them are brought to bear upon their work. The professional cultivator has perhaps greater incentives, and in many instances better facilities, for conducting the work, but the amateur who determines that he will do his best to deserve success will have no cause to regret his labours. Let him take courage from the success of Silas Cole with Countess Spencer and Earl Spencer, of Alexander Malcolm with Edrom Beauty and Masterpiece, of H. A. Perkin with the peerless Nancy Perkin, of—but the multiplication of names will not add strength to our case ; sufficient have been specified to prove that the amateur raiser is already a power in the land, and will become a greater one in the future.

Before leaving the question of raising new varieties, it should be pointed out that the unfortunate lack of fixity caused much thought to be given to the whole question of cross-fertilisation. Efforts have been made to ascertain whether the Mendelian laws of inheritance apply to the flower. Mendel proved to the point of demonstration that plants have characteristics absolutely defined and unalter-

able. He knew that if he crossed certain plants he would reap certain results, and that in the second generation the seedlings would show a splitting up into varieties, and he was able to state beforehand what proportion these variations would have to each other, and to affirm that some types known as "recessives" would be constant. As far as the Mendelian laws in relation to Sweet Peas are concerned, Alexander Malcolm claims to have proved that they do apply. He is a most painstaking, skilful, and experienced worker, and the results which he has achieved have more than satisfied him that he is proceeding on the right lines.

The theory is elaborate and it demands thorough study. Those who would enter upon it should consult Professor Bateson's *Mendel's Principles of Heredity*, which is published by the Cambridge University Press; or the same author's *Methods and Scope of Genetics*. Mr. Cuthbertson contributed some information on the subject in the *Sweet Pea Annual* for 1909; and an excellent article, with a coloured plate, appeared in the *Gardeners' Chronicle* for July 24, 1909.

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necessary, to provide mulchings of good manure, while water and liquid manure will certainly have to be afforded according to the state of the weather and soil. All this may sound a little formidable, but as a matter of fact it is perfectly easy if a proper start is made and good management is practised at all stages.

SOIL PREPARATION

Emphasis has already been laid upon the paramount importance of working the soil. It is not only possible, but easy, to grow good Sweet Peas without the addition of any manure to the soil, provided that a fresh position be chosen each season and that the site was generously manured for the preceding crop. In such cases the ground will contain a quantity of nutrient matter which mechanical working will render available to the plants. On the contrary, injudicious manuring would not, in the absence of soil working, bring about good results. Thus it is seen that soil working stands first in importance. Three methods are open for adoption according to circumstances—(1) digging; (2) bastard, false, or mock trenching; and (3) full or true trenching. It may be said here that the third system should never be attempted unless the cultivator is absolutely certain that the subsoil, which will in this case be brought up to form the surface soil, is perfectly

PLATE III
EVELYN HEMUS



sweet through previous aeration following upon deep culture.

Digging, a process by which a depth of 12 inches of soil is turned over, is good as far as it goes, but those whose land is so shallow that they cannot secure a deeper rooting medium than this must not expect to achieve the same results as others who have soil 2 or 3 feet deep. However, a 12-inch depth of thoroughly friable, sweet, fertile ground will grow some grand plants; and if the flowers are not all fours or fives upon a stem, and the stems are not all 20 inches in length—What matters it? Judicious watering and feeding will encourage the successive production of blooms, provided that the flowers are picked from the plants either just before, or when they are at, perfection. In the process of moving the soil, more particularly if the work has to be done in the spring when the grower cannot have the invaluable assistance of the weather as a disintegrator, small bites should be taken with the spade or fork, and the tool should be driven down to its utmost depth. This will go far to favour the friability that is so desirable for seeding or planting, as the case may be.

In bastard trenching, the cultivator is able to increase the depth of soil available for the roots—indeed, when ground has been bastard-trenched three or four years in succession, there should be no difficulty in moving the

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soil to a depth of 2 feet, and it is commonly possible to bastard-trench 3 or even 4 feet down ; and when this enviable condition is reached there is nothing that the grower should not be able to do in the production of Sweet Peas.

The digging itself will be as thorough in the upper and lower spits as when only a single layer is being moved, but the original positions of the strata will be retained. This is the best form of soil working for general adoption, since it invariably tends to the benefit of the crops, and in no circumstances whatever can it do the slightest harm. In some lands it will only be found feasible in the first season of trenching to loosen 5 or 6 inches of the second spit with a pickaxe, but if it is followed up, season after season, the depth of friable mould will steadily increase until the maximum of soil is reached, and at that stage the grower may, if he so desire, have recourse to true or full trenching ; for the lower portions will then have become sweet, and there will be no danger in bringing them up to form the surface soil.

It has been stated that there is an ever-present element of danger in true trenching, unless the grower is convinced of his own knowledge that the subsoil is sweet, and this fact must always be kept in mind. If a soil is trenched and it is ascertained upon completion that the new surface is so sour that sweetening is impossible in the time that

will elapse between the working and the seeding, the best thing that can be done is to commence again and re-trench, in which process the two soils will regain their original positions. The operation will then become more than ordinarily laborious, but the worker will have the satisfaction of knowing that, as far as mechanical working is concerned, it would be quite impossible for him to do more for his plants.

In true trenching the depth of moved soil should never be less than 2 feet, and it ought to be 3 feet or a little more. There are those who advocate the trenching of soil to a depth of 5 or 6 feet, but one seldom sees this put into practice, and it is almost certain that the amount of good which the plants derive from it is quite out of proportion to the labour entailed. The roots of Sweet Peas seldom penetrate lower than 3 feet beneath the surface, and, if they did, the probabilities are that their lower extremities would not possess any great power of feeding. The benefit, then, would be merely indirect—the root-run would be cooler and the soil would remain moist longer in dry periods. Each grower must exercise his own judgment as to the form of cultivation that is likely to yield the best returns in his soil, and he can experiment for two or three seasons until he makes himself master of the problem.

Time of Soil Working.—Not only, however, has the particular method of working to be considered, but the

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time of doing it; and here again much must depend upon circumstances which the individual alone can know. As a general rule, medium to strong soils should be thoroughly cultivated in the autumn and early winter, and the surface ought to be left in as rough a condition as possible, to encourage the free passage of water and ensure the utmost advantage from the action of frosts. In a climate where the rainfall is heavy and winter frosts are not severe, this system might be followed by a state of affairs that would be the reverse of satisfactory—instead of the lumps being freely penetrated by frost, which by expanding the water into ice would force the lumps apart and produce a fine tilth, the mould would remain in a close, pasty condition, that would require weeks, or even months, before it would be possible to do much with it.

It will, therefore, be readily seen that the grower must largely draw upon his own experience and knowledge in the matter of soil working, especially where the land is heavy, since advice from one who has no real acquaintance with all the circumstances of the case may easily lead to disaster. Let such soils as are apt to close down after autumn working stand over until the spring, and then put the work in hand immediately the ground is in a fit condition. The cultivator must exercise discretion in this direction, since it is far wiser to defer the commencement of operations than it is to go on the land when it is sodden with

wet, as this would cause it to be trodden down closer, making it more uncongenial than it was before. Always dig such soils in small spits, and after the cultivation is complete, seize every possible opportunity to break down any lumps there may be ; weather that is bright after showers will be favourable to this operation, and its neglect will spell comparative failure.

It is necessary now to give some consideration to the light, sandy soils common in various parts of the country. They are not as suitable for Sweet Peas as are those of a stronger nature, but, as it is obviously impossible for the amateur to import to his garden the particular soil which is more especially adapted to each individual crop, it behoves him to do the best he can with that at command. As far as Sweet Peas are concerned, correct methods of procedure will bring a most generous reward even in sandy soils. The conditions of success are depth of working, judicious manuring, and consolidation before either sowing seeds or putting out plants. The deeper the soil can be cultivated, the longer it will hold moisture and plant food in suspension, and, as a natural consequence, the longer the plants will continue in health during the hot, summer months. But no matter how deep the cultivation may be, the desired results will not be obtained unless the soil is thoroughly consolidated, and this must be done by repeated treading prior to planting.

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Unlike stronger soils, it is sound practice to let the light ones lie solid through the winter, and in many instances direct good will accrue when a few annual, surface-rooting weeds are allowed to grow unchecked from November until the time of working in the spring. Objection will perhaps be lodged to this suggestion by many growers, on the score that the weeds will draw supplies of food from the soil, and thus the legitimate crops will be robbed ; but there is really very little in this argument. The weeds will certainly obtain sustenance from the soil, but they can afterwards be buried at least 10 inches beneath the surface, when, in rotting down, as they are sure to do in due course, they will return to the soil the food which they had previously drawn from it, and the next crop will derive the benefit. It is not only, however, in this direction that the weeds do good in light soil, but in the fact that they prevent the water rushing as freely and as rapidly through as it would do if the soil were left bare, or roughly turned up in the autumn, as is advocated for loams and clays.

As early in February as it is convenient to get on the ground, the process of working light soils should be put in hand. Nothing short of a depth of 3 feet will give the best results with Sweet Peas, and if the depth can be increased without very much trouble to half as much again, so much the better for the plants. It is excellent practice to tread down each spit as the process goes on, since, when

the soil is loosened to the depth recommended, surface treading will only do real good in the top 9 inches or thereabouts, whereas the consolidation should be carried far deeper than this. The greatest care must be exercised in this matter, no attempt at treading being made when the land is soddened ; while to start to do it when it is as dry as dust is tantamount to wasting time, for it will not have the slightest effect. Choose the happy medium between the two, preferably when the condition is just on the dry side, and the full value of the process will be secured.

In all cases, whether the soil is heavy, medium, or light in texture, mechanical operations in connection with it must be completed by the earliest possible date in March, so that sufficient time may elapse between the final digging over and the sowing of seeds or the planting of plants as the case may be. Thus with roughly dug surface soil which has weathered through the winter, the forking over to provide the necessary smooth and friable tilth must be done in February and March, and especially so when the sowing is in the open, for only by getting the seeds in by or before the end of the latter month can the cultivator hope to obtain perfect flowers at the middle of July, rather earlier or later according to the season. There should be a depth of 10 inches of perfectly friable soil, as this will favour the satisfactory growth of the young roots. With light soils let it

be again said that the final treading immediately in advance of seeding must never be overlooked.

Manuring.—Hand in hand with the mechanical cultivation of the ground must, of course, run the manuring, and it is an aspect of culture that demands the most intelligent consideration. Although concentrated fertilisers are often extremely valuable, they will not do all that is necessary to ensure success with Sweet Peas. These free and deep-rooting plants must have a soil with body in it, and this can only be provided when natural manures are employed ; but with these, and fertilisers as supplements, one may confidently anticipate satisfaction.

Precisely as it is imperative with the mechanical working to consider the time of year, so it is with manuring. The loams and clays, which possess the power of holding plant food, should be manured in the autumn. The light lands, which lack this retentiveness, must not be dealt with until the spring, or the probabilities are that more than three parts of the plant food will have been washed down long before the roots are actively working in the late spring and early summer months, while by the time they are needing full supplies there will be practically no nutrient matter left.

Assuming that the natural manures most generally available are farm-yard or stable dung and cow excrement, the former should be chosen for the strong soils, and the latter

for the light lands. A clay soil requires opening up to the freer passage of water and air, and horse manure containing straw aids substantially to this end. If there is any choice in the matter of manures, let that containing long straw be selected for clay, that with medium straw for the strong loams, and that with short straw for the lighter loams. The applications in each of these instances will presumably be made in the autumn, and the materials may be comparatively fresh as compared with those that would be applied in the spring, since an autumn dressing allows abundance of time for the manure to become sweet before the roots of the plants are working freely in it. The manure that is worked into light soils, or into others which necessity compels the grower to cultivate in the spring, must be thoroughly rotted and perfectly sweet at the time of use.

There are, broadly speaking, only two systems of working in the manure. The first is to thoroughly incorporate it with the soil as the digging or trenching proceeds, and the second is to take out trenches and put the manure in these in solid layers. While the latter method may favour the development of longer stems, it also encourages a grossness that is far from being satisfactory, as it shows itself in the flowers, and often gives them that floppy, unwieldy appearance that very nearly makes the Sweet Pea ugly because it looks so coarse. The worst manure of all for encouraging this undesirable state of affairs is night-soil,

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but excess of any kind will lead to the same trouble. In the light, sandy soils which some growers have to work, it is perhaps permissible to put in a layer, 6 inches or so in thickness, between the second and third spits, but it should not be done in any other circumstances. In all instances where it is deemed imperative that a layer of some sort should be put in to arrest the too free passage of the food-laden moisture, the preference might well be given to turfs 3 inches in thickness, placed rather deep with the grass side underneath, and then cut through several times with a sharp spade ; these will answer the purpose for which the layer is particularly intended without bringing with them the risk of coarseness. In shallow soils, where it is impossible to get down even two full spits, the manure should be laid on the second spit and then worked in as much as possible. In all other cases, unless there is some special reason to adopt another system, let the manure be thoroughly incorporated with the lower soil, and, if any is placed in the top spit, let it take the form of refuse material such as that from old hotbeds or cucumber pits, as this will provide something to which the young and tender roots will take quickly and at the same time give a little food ; this stuff is more valuable on strong than on light lands, and should not be worked in until the spring, or its full value will not be secured.

In many instances it is to be feared that success is not

obtained simply because the manure at command is poor in quality. When natural manure is stacked in heaps and exposed for months to the weather, somewhere about three parts of its food virtues are washed out of it before it is put into the soil. It should always be stacked under cover, where it is impossible for the rains to pass through it, and the liquid which naturally drains out of it must be saved for future use.

In the possible event, then, of the manure being poor, the grower must turn to the concentrated fertilisers to provide compensation. The usual practice is to apply these when the soil is being finally prepared in the spring, but they can be used in the autumn, and in certain circumstances will then give superior returns. It is, however, essential that whatever is applied at that season of the year shall be slow in yielding up its food properties, or the value of the application will be almost wholly lost to the plants. As a simple dressing for Sweet Peas there is nothing better than basic slag, finely ground, and used at the rate of 10 to 12 lbs. to the square rod, and even more where the dressing of dung is light and its quality inferior. This will not meet all the requirements of the plants, since it gives no appreciable amount of potash, which is essential to the finest results, therefore it must be supplemented with kainit at the rate of 6 to 8 lbs. to the rod. This latter salt is valuable as a soil cleanser as well as

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a fertiliser ; it should be applied in autumn to give the best results.

A second form of using concentrated fertilisers, and one which serves admirably in many instances, is to mix whatever is chosen in with the manure itself prior to working it into the soil. One stone of kainit and two stones of superphosphate of lime, spread evenly on a thin heap of manure weighing approximately one ton, and then the material turned inwards and outwards two or three times to work the fertilisers right through, will improve the dung by somewhere about 30 per cent., and that is a consideration worthy of note.

It will be observed that nitrogen is omitted in each of these suggestions, since in all soils it is far better used in the spring, and in the majority of cases is best held back for exclusive use as a stimulant. For spring use sulphate of potash should take the place of kainit, and the quantity must not exceed, except in the rarest circumstances, 3 lbs. to the square rod. Superphosphate will also be necessary, and a good dressing is 6 lbs. to the square rod. In the possible event of nitrogen being needed for application early in spring, mix equal proportions of sulphate of ammonia and nitrate of soda, and use 3 lbs. to the square rod ; the mixture gives finer results than an equal quantity of either used alone, and it must be forked into the top 8 inches of surface soil.

CHAPTER V

SEED SOWING

FORTUNATELY, the grower of Sweet Peas has ample latitude in regard to seed sowing. He has not to depend upon the conditions of weather and soil being ideal in any particular week, for he can commence sowing in September, and continue monthly, with the exception of December, until the following April—there have been instances where a May sowing has produced excellent plants which have blossomed freely very late in the season. During recent years the practice of sowing in pots, either in the autumn or the spring, has become more and more popular, and there are amateurs who appear to think that it is only in this manner that the best exhibition flowers can be produced. This, however, is very far from being correct. Assuming all other things are favourable, it is just as easy to grow good flowers from seeds sown out-of-doors in autumn or spring, according to conveniences and circumstances, as it is from seeds sown under glass at those seasons. It is, of course, obvious that pot-sown seeds and plants are more under the complete control of the cultivator than those out-of-doors ; but apart

from this there is no substantial advantage in the system. Autumn sowing is advantageous in giving a longer time for the plants to root in, and, although they may not gain materially in earliness over spring-sown seeds, this superior root development will tell in the substance and colour of the blooms; but when all is said, the grower must settle the point for himself.

Autumn Sowing.—Now let us particularise a little as to the best times for autumn and spring sowing, and we will take outdoor work first, as being the more generally convenient. Those who live in cold districts and have to contend with a strong, close, clayey soil should endeavour to get seeds in during September, early or late according to the weather. The seeds should be sown more thickly than in more congenial soils, but attention to this point will be drawn in due course. In either strong or medium loams the best month is October, while in warm sands November will prove the most generally suitable. If there is a cold frame at command, the middle of October is an ideal time for sowing, and 6-inch pots should be given the preference over those of smaller size, since they afford additional root room, which Sweet Peas greatly appreciate. Five seeds should be set round the sides of the large pot; or if it is necessary to use 3-inch pots, then put one seed in the middle and be prepared to replot as early in the spring as possible. Few growers, however, care to go to this

PLATE IV
QUEEN ALEXANDRA



trouble with Sweet Peas, but it will be commonly found imperative in exhibition culture, with which my experienced friend and most successful grower, Thomas Stevenson, deals on another page. If under-glass sowing in the autumn is adopted, the utmost care must be taken not to coddle the plants, or the results will prove the reverse of satisfactory ; on the contrary, keep the frames open whenever the weather will permit of it, so that the growth shall be strong, hardy, and sturdy from the start.

If mice find their way into the pots, they will eat all the seeds of the best varieties. The simplest method of preventing them is to place a pane of glass over the top of each pot, since it is from the surface, and not from the base, that they work ; needless to say, immediately the seedlings show through the surface the glass should be removed. At that stage danger will come from slugs, which ought to be hunted for and trapped persistently, and birds, which still attack the plants whenever they get the opportunity. An effectual method of preventing them is to have a light framework of fine-meshed galvanised wire, made exactly the same size as the light, and when the latter is off, let the wire be placed in position. Should birds top the plants once it is not of serious moment, but they must not be allowed to do it repeatedly or the plants will die.

Spring Sowing.—Passing now to spring sowing, we

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shall commence towards the end of January, in pots, and again the preference should be given to large ones if it can possibly be made convenient. Either a greenhouse or a frame will answer the purpose, provided that the heat is very gentle ; high temperatures will, of course, favour quicker germination and more rapid progress subsequently, but the growth will be weaker and the difficulties and dangers, when the time arrives for placing the plants in their permanent positions, will be materially increased. At the same time, absolute cold is not good for Sweet Peas sown in January. Where there is no heated structure, or that at command is too hot, it will be wiser to wait until the middle or end of February before sowing ; the grower will not then have to worry for fear of the plants becoming drawn before the soil and weather are favourable to planting. Out-of-door sowing in spring may be done at any time after the middle of March up to the end of April with every prospect of success. In gardens where the soil is light and warm a start may be made in February, particularly if a sheltered situation can be added to the other advantages named. Taking one season with another, the fourth week of the month of March is usually the best period.

When pot culture is decided upon, the grower must be prepared not only to give the plants attention from the time that they show through the surface, but also to provide

a special soil mixture. The ordinary soil of the garden may, and does, answer perfectly for seeds sown directly into it where the plants are to flower, but it is seldom good enough for use in pots. However, the compost is far from elaborate, and may be easily provided by those who will take a little trouble. The principal ingredient must be sound, fibrous loam, and of this there may be three parts, all the fibre being retained and only the finest dust removed ; then there should be one part each of refuse manure and sweet, thoroughly decomposed leaf-mould. If there is the slightest doubt as to the quality of the leaf-soil, omit it entirely and rely upon the manure, since inferior leaf-mould will do far more harm than good, and on more than one occasion it has led to complete failure. Beyond these things it will be necessary to add, roughly, a tenth part of sharp sand to ensure the perfect porosity of the mixture. The ingredients should be mixed thoroughly quite two, and preferably three, weeks before use, and it must then be in a pleasantly moist state, no matter what varieties are being sown.

It is imperative in pot-sowing to make some distinction between those varieties with white seeds and others having mauve in the colour of their flowers, and the ordinary black or brown-seeded sorts, or the results may prove disastrous. It is well known to all experienced growers that the mauve-coloured varieties invariably have most

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wretched-looking seeds—usually very small, and commonly spotted and wrinkled—and these, with the white ones, are very apt to rot in the soil if it is kept too moist or they are set too deeply. For these, then, the cultivator should use a rather lighter soil, with an increased proportion of sand, surface the soil with pure sand, set the seeds not more than a quarter of an inch deep, and cover them with sand. Further than this, the soil should be kept drier than is either necessary or desirable for the majority of sorts. For all brown and black seeds the depth may be between half an inch and an inch, and the covering-in should always be done with fine soil. Many cultivators chip all seeds prior to sowing, but the practice is rarely necessary. If it is seen that the plants are not showing through the surface within a reasonable time after sowing, the soil should be turned out carefully and the seeds found; if they are still sound they can be chipped and re-sown; if they have rotted the matter is ended, and a second sowing must be made forthwith. Although this appears to be more trouble than chipping the skins of all seeds at the outset, it is preferable. In the white-seeded varieties, and also in one or two with black skins, split seeds are comparatively common, and, notwithstanding the care that is taken by seedsmen to pick them out, some will assuredly find their way into the packets. The grower should not give himself a moment's anxiety about them; they will simply

germinate rather quicker, but care must be taken not to get the soil wet.

Having dealt with the manner of sowing under glass, we will now turn to outdoor sowing, which, as already stated, is still far more extensively practised by the cultivators than under-glass sowing. Much has been said and written as to the marked advantages of sowing in flat-bottomed, shallow trenches or drills, as compared with the triangular drills drawn with the heel of a cutting hoe, but there are still many amateurs who adopt the latter system. They should drop it instantly, for the simple reason that triangular drills are prejudicial from the start, and the results can never, therefore, be as satisfactory as when the plants proceed perfectly from the earliest stages.

Every grower of Sweet Peas should decide to have shallow trenches in future. It is obvious that the depth will vary slightly according to the texture of the soil—the stronger it is, the shallower the cutting should be; the lighter it is, the deeper the trenches should be. In any case they must not exceed 4 inches, and never be less than 2 inches. It should not be assumed that the seeds will be covered to the full depth in either case; on the contrary, a surfacing of 1 inch to $1\frac{1}{2}$ inches suffices according to circumstances, and the greater depth of cutting is simply advised so that the stems can be

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moulded up a little as protection, without bringing the level up to such a degree that it looks like a miniature Potato hill.

Another important point in direct relation to sowing is the distance at which the seed ought to be placed. The advice to sow thinly has been insisted upon often enough by experienced growers, but it is certain that ideas as to what constitutes thin sowing are varied and confused. Some growers will place the seeds about three deep in the drill. Then comes the individual who considers that a single layer is the ideal of thin sowing, and still another sets them 12 inches asunder, forgetting that some of the seeds may fail to germinate, that mice may demand a toll before the seedlings are through, that slugs and birds will also take a share, until, when the thinning by these means is finished, the plants may stand at anything from 3 feet to 6 feet apart for flowering. As a matter of fact, it is exceedingly difficult to lay down a hard-and-fast rule that will suit all cultivators, but if the distance varies from 1 inch to 2 inches it is almost impossible that the grower can go far astray. There will then be sufficient for the mice, birds, and slugs to have a fair share and for the thinning to be completed so that a distance of 12, 15, 18, or 24 inches separates the plants in the rows. Those who aspire to produce exhibition blooms will be wise to follow Thomas Stevenson's advice, while the immense majority,

who grow plants to yield an abundance of flowers for the immediate adornment of the garden, will allow the plants 12 to 15 inches asunder in the rows, and know that they are doing the right thing.

It is necessary to draw attention to the fact that the plants can be grown in either single or double lines, but the former method is much to be preferred. For a single line of seeds the shallow trench may be anything from 4 to 6 inches in width, whereas for a double line it must be at least 15 inches, and the seeds should be placed within an inch of the edge on each side. The particular object of this is, of course, to leave a wide space between the plants at the base, so that there will always be an abundance of fresh air playing about them ; and this should be still further encouraged when the plants are thinned out to the flowering distances by removing those in the one row which come opposite to those in the other ; the plants will thus stand triangularly, or, as it is commonly termed in gardens, "opposite vacancy."

Supporting the Plants.—No matter whether the plants are growing in pots or the open ground, it is imperative that they shall be given early support. The youngster that is permitted to fall over and lie recumbent for only a few hours is seriously prejudiced from the start, apart altogether from the fact that there is always a danger, when it is necessary for the plant to be drawn upright, that it

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will be snapped off. The grower who desires to pose as a philosopher will, of course, immediately affirm that he had intended to top the plant in any case, and that he has been saved the trouble ; but the probabilities are that his private views on the point would be somewhat different. The rule should be to place sticks to the seedlings before they attain to the height of 4 inches, and to these preliminary sticks the young plants should always be carefully attached with bass or other convenient material. The Sweet Pea is a tendril-producing plant, and in principle these natural supports should be sufficient, but in practice this seldom proves to be the case, and artificial support must be given. For the early sticks the brashy parts may be cut from the tops of the final stakes if desired, or the twigs from an old besom may be requisitioned ; in any case they ought to be about 15 inches in length, so that approximately they may be placed 3 inches deep in the soil and extend 12 inches out of it. The chief point for the amateur to keep in view in this early tying is to make perfectly sure of adequate support without arresting the advancement of the young plant, as will inevitably be done should the ligature be put on too tightly.

Before the plants reach the tops of the twiggy sticks the permanent ones must be put into position, and these can be of hazel or other convenient natural wood ; or ordinary, large-meshed, galvanised wire, or one of the

excellent, specially made wire frameworks may be procured for the purpose. It is indisputable that there still exists in the minds of many amateurs a prejudice against any other support than that of sticks, but the wire answers perfectly well, and has the advantage of being to a large degree permanent, since, if proper care is taken in storage after use, it will last for many seasons, and thus come out cheaper in the long run than sticks, except in those districts where good sticks can be bought at low prices. The height of the sticks or the wire, as the case may be, will necessarily vary in accordance with the usual height to which the plants attain in the district.

Planting Out.—When the plants are grown from seeds sown under glass, either in the autumn or the spring, there will come a time, almost invariably in April, when they will have to be put out into their permanent positions. This operation demands both judgment and care—judgment to know precisely when the plants and the weather are both especially favourable, and care to guard against the possibility of the smallest damage to the roots. One of the commonest objections to sowing in large pots, rather than in small ones, is that unless the entire mass of soil and roots is planted intact, in which case the plants will be far too close together, the roots will assuredly be more or less seriously injured; but this will not be so, provided that proper care is taken in the process. When all the condi-

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tions are satisfactory to the work being done, the soil in the large pots should be allowed to get just on the dry side by withholding water the day prior to the task, and then it will be found exceedingly easy to separate the plants without a single root being injured. As soon as the comparatively dry mass is turned out of the pot, place it on its side on the blade of the spade or a piece of board procured for the purpose, and steadily press downwards, when the mass will crumble and the plants can be individually chosen for immediately planting.

It is most important when this is done that the soil shall have been thoroughly soaked a few hours previously, so that the roots shall not be put directly into dry soil, or they will experience a check of more or less severity. It may or may not be deemed necessary to water afterwards ; as a general rule it is wise to do so, since it will settle the soil well down to the roots ; but in all instances watering should be done in advance if the ground is dry.

The distance of setting the plants, whether they are in rows or clumps, will obviously be that at which the plants will remain, since it is not now anticipated that there will be any losses. Those who do not feel that they can separate the masses without breaking several of the roots should plant intact, and then draw out the stems to supports placed at some distance from them, in order to ensure an ample distance between the five in the group ; but unless this is

done with the utmost skill it is not as satisfactory as division. Plants in small pots will, of course, be put out with the mass of soil and roots unbroken, as there would be no benefit in any disturbance. The soil must be made firm, but it should not be trodden down as hard as the proverbial macadamised road, as is occasionally done, and especial care must be taken in this operation if the soil is on the wet side when the work is done, or it will settle down into a close mass, impenetrable alike by water or air. In the possible event of this occurring, the first available opportunity must be taken of opening it up, but be careful that the roots are not disturbed in the process ; unless air can penetrate, it is certain that the progress will not be as good as it ought to be, and as it must be to give the best blooms.

Unless the plants are grown exclusively with a view to the production of exhibition flowers, it is improbable that they will be restricted to single stems. It is true that when they are sown as thickly as Mustard and Cress, and thinning is entirely neglected, they will only develop single stems, and poor ones at that ; but if all parts of the plant have the benefit of unobstructed light and fresh air there may be any number from two to six stems, according to the fancy of the grower ; but the more there are, the further must the individual plants be set apart.

In most instances plants having three stems in a space of 15 or 18 inches, preferably the latter, will give quite

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satisfactory returns ; for the flowers will be excellent in quality and carried on stout stems of good length. Whether the plants will flower continuously over a protracted period very largely depends upon the persistency with which the grower keeps the blooms picked ; if he allows seed pods to form, then he must expect to see the productiveness of the plants fail rapidly. Just before the flowers attain to perfection is the best time to gather, as well in the interests of the flowers themselves as of the plants.

Immediately the plants are in their permanent positions the grower should provide the supports necessary (where wires are used it is better to set them in place beforehand and plant up to them). The sticks must be sufficiently long to permit of a good length going into the soil, or they will inevitably be blown down when the plants are in full activity and there comes a high wind. They should be carried perfectly uprightly or, and still better, lean outwards slightly at the top, and not inwards, as is too commonly seen. When the latter style is adopted not only is the support insufficient at the top, where it is more especially required, but air is prevented from circulating freely among the growths, and the result is that they do not blossom as profusely and continuously as they would do were the conditions more favourable. If the plants are grown in parallel lines, these should run slightly north-east and south-west if possible, and not dead north and south ; there ought to be a distance

of about 6 feet between them. The distance between clumps must obviously depend upon their size ; some are only 3 feet in diameter, while others run to 6 feet, and even more than that in many gardens.

Watering and Feeding.—If the soil is thoroughly and deeply cultivated to start with, and generous applications of manure are incorporated, it is not likely that the plants will require any water until they are showing buds ; in any event it is wise to defer watering until it becomes imperative, especially where hard, tap water alone is available, for if this is repeatedly given the temperature of the soil will be gradually lowered until it reaches a point at which the plants cannot absorb food. As soon as it is clear that the soil is becoming dry, watering must be done, and it should be such a soaking that the ground will be moistened to a depth of about 3 feet. To ensure this it is necessary to apply 3 gallons to the square yard on the majority of soils, and 5 gallons will not be a drop too much on light lands that overlie gravel. This done, the grower should not make the slightest attempt to water a second time until the soil is again almost quite dry.

With the plants in full bud and bloom, it will be essential to assist them with weak liquid manure, and this must always be given when the soil is moist after rain or after artificial waterings have been afforded. The quantity ought to be exactly the same as with clear water, and the latter

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must always come between two applications of liquid manure. Just how often feeding will be needed depends upon the condition of the soil and the plants, but nothing is to be gained, and something may easily be lost, by excessive applications.

In regard to the particular form of stimulant or food that will be given, it may be taken for granted that each grower will work according to his own convenience ; and fortunately Sweet Peas are not fastidious in this matter, but will, when in full vigour and perfect health, be thankful for anything good that may happen to come along. The principal point that the cultivator must keep in view is to provide as great a change as possible, and in no circumstances to give the same food in the same form twice in immediate succession. Soot-water or liquid manure from the farm-yard will answer admirably, and a fairly safe guide to strength is to give them of the colour of weak tea or pale ale. As a special stimulant nitrate of soda or sulphate of ammonia, at the rate of one ounce to the gallon of water, is excellent, and will increase the richness of the colour in both leaves and flowers ; but if nitrate of potash is at command it is superior to either of those named, for the reason that it will improve the substance and texture of the blooms as well as the colour. It must not be used at a greater strength than half an ounce in each gallon of water, and three gallons to the square yard should be the rule.

PLATE V
MRS. HUGH DICKSON



In order to secure the full advantage of the food that was originally put into the soil, and also that which is given in the form of liquid manure, it is imperative that the surface soil shall either be persistently loosened with a fork or a hoe, or that a mulching of manure shall be spread over the entire area. Obviously the latter is the better system, since at the same time as it conserves the moisture in the soil it adds food to it, and thus affords a double benefit. As a rule the shorter the manure for top-dressing the better, but if necessary, longer stuff can be utilised, in which case it is wise to fork it up occasionally, or it may settle down into a close mass and prevent air penetrating freely into the ground, thus doing as much, or even more, harm than good. Before any mulching is applied the grower should loosen the surface soil and destroy all weeds. In most cases it will be wise to draw back the dressing when water or liquid manure has to be given, replacing it as soon afterwards as it is wise to go on the soil. It will also be found beneficial to hose or syringe the plants forcibly on the evenings of intensely hot, dry days.

Although the plants will continue to produce flowers in succession over a long period when the management is good, it is certain that there will come a time when they show signs of failing, and the blooms will neither be so numerous nor the stem stalks so long. The display in many instances will be maintained by plants that have been grown

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on from later sowings, but when they are plainly exhausted excellent results frequently accrue upon cutting them boldly down to within 3 feet of the ground and starting them on a new lease of life. The soil must be carefully loosened, all mulching either pricked in or entirely removed ; watering and feeding with liquid manure must be rather more generous than was the case before ; a fresh application of manure should be put on ; each plant must be limited to three stems, and the reward will be a second crop of blooms, about six weeks later, almost equal in quality and quantity to the first flowers. This system does not always yield the desired results, as much depends upon soil, situation, and management, but the frequency of success is sufficient to warrant a trial in all gardens.

No reference has yet been made to nitro-culture, which was much talked about a short time ago. It now seems clear, after most careful trials, that in thoroughly cultivated and intelligently manured garden soils the system of treating the seeds or the soil with nitro-bacterine cultures does not materially improve matters ; in some soils it may be advantageous, while in others there is no difference between plants so treated and those grown in the ordinary manner.

CHAPTER VI

CULTURE UNDER GLASS

THE culture of Sweet Peas in pots under glass is not the most satisfactory thing in the world to carry out. If the structures are exceptionally light and the provision for ventilation is perfect—these conditions prevail in market growers' houses—the degree of success will satisfy those who are not especially critical. In the ordinary greenhouse, however, with its varied occupants, the results are often the reverse of gratifying, for the plants take up a considerable amount of space, demand incessant attention from the time the seedlings appear through the surface of the soil, and the flowers they yield are often few in numbers and poor in substance. However, many growers will make a trial, and it is hoped they will do thoroughly well. The requisites are simple enough. There should be 10 or 12 inch pots perfectly drained and filled to within an inch and a half or thereabouts of the rim with a compost of three parts turfy loam, pulled to pieces and used, except at the top, in a lumpy condition, and one part of sweetened manure, with an addition of sand varying

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according to the consistency of the loam ; the stronger the latter, the more sand is needed. Not more than six plants should be placed in each pot, and when they are staked care must be taken to run the supports outwards at the top so as to ensure the utmost amount of light and air reaching every part of the stems. During the early stages it is necessary to water with great judgment, as it is extremely easy to make a compost sour when roots are not working freely in it ; but when the plants are in full progress, both water and liquid manure, the latter, as usual, weak and in good variety, will be essential. From the commencement the plants must be given the lightest position in the house. The temperature should never be excessive—a maximum of 50 degrees is quite warm enough, unless there is a special reason for endeavouring to encourage the buds to expand rather more quickly ; and even then it is well within the bounds of possibility that the plants will draw up to a height of ten or more feet, and there will not be hundreds of splendid flowers such as an equal number of plants would yield out-of-doors.

The Télemly and American winter-flowering varieties answer well in suitable structures, but they are not generally adapted for amateurs' houses, for the reason already given, that there is not sufficient light and air. In the ordinary way the seeds should be sown early in the spring, precisely at the same time as if the plants were for outdoor

culture, and the treatment throughout will be the same, except that, instead of sowing in small pots, the seeds should be put directly into those in which the plants are to bloom. Or, if it is preferred, the seeds can be sown in boxes—which, by the way, is an admirable system for general purposes—and when the plants are 2 or 3 inches high they must be transferred to the flowering pots. If pots of the size suggested are not readily procurable, smaller ones may be used with fewer plants in them, and they will then demand even more care in feeding; and the best results will only be secured when collars are put inside the rims of the pots for containing top-dressings of rich compost.

For winter-flowering, seeds should be sown in August or September, and the plants will succeed best when they are grown in thoroughly prepared soil which is not made too rich with organic manures, as these latter encourage gross growth.

CHAPTER VII

SWEET PEAS FOR THE GARDEN

OPINIONS vary as to whether plants grown in rows or clumps produce the finer blooms, some growers insisting that rows are preferable, while others are equally emphatic that clumps give the better results. As a matter of fact there is probably little or no difference. The reason that clumps came so conspicuously into favour was, no doubt, that the soil was worked better, more space was given, light reached all parts of every plant, and the natural consequence was that the blooms were superior in every respect to those grown on plants in rows under the careless system that prevailed before the Sweet Pea became the important plant that it is at present. If the rows are given the same chances as the clumps as far as mechanical culture and manuring are concerned, and ample space is allowed the plants, there will be nothing to choose between the returns either in quantity or quality.

For the decoration of the garden, however, there is much to be said in favour of clumps, since they can be made to give a more artistic effect than rows. For the

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back line of a wide border a row of well-grown Sweet Peas is unsurpassable in beauty, and if the colours are judiciously chosen a mixture will be more attractive than individual varieties kept separate ; but for beds, and placing at intervals in borders, clumps of distinct varieties are to be preferred. Much depends upon the extent of the bed or the border how far the clumps should be set apart, but nothing is gained by packing them until it is possible that the loose sprays from one will find their way among the growths of the neighbouring clump, while it is of the utmost importance, especially in borders, that they shall not present a level line throughout the entire length, but that some shall be set 3 feet back, while others will be 5 or 8 feet away from the verge, or even more than that if there is room. By adopting some such system as this, formality is avoided.

Such clumps will give exhibition blooms if the culture has been perfect throughout, but their value will lie mainly in supplying continuous flowers for cutting, for the decoration of rooms, and for distribution among friends. The absolute necessity for close picking must never be overlooked by those who require a long succession, which is also substantially favoured by watering and mulching.

CHAPTER VIII

SWEET PEAS FOR DECORATIONS

IN this one respect, if in no other, the Sweet Pea may be said to be the foremost flower in British gardens at the present day. Whether blossoms are required for the adornment of the home or for purposes of exhibition, the Sweet Pea will meet every demand that is made upon it, and in the hands of a skilful manipulator it is perfectly certain that an arrangement can be made which will excel in artistic beauty that which will be forthcoming from any other flower.

Plants grown for the decoration of the garden will yield thousands of flowers for cutting, and since it is not essential in the filling of vases, epergnes, and other ornaments suitable for the display of the flowers, that each stem shall carry four or more blooms on its length of anything from 16 inches to 2 feet, it is not imperative to adopt elaborate methods of procedure in the cultivation of the plants. At the same time it must be kept in mind that the plant which is grown in poor soil, and is still further prejudiced by not being allowed an abundance of space in

ARRANGING SWEET PEAS 67

which to grow, will neither give the numbers of flowers nor the quality or richness of colour which go so far to provide the most delightful effects.

In the majority of instances varieties of one, two, or three colours are ample in each vessel, but occasionally mixtures may be employed to create a decided change. Care must be exercised to set the stems in such a manner that each bloom shows its full charm, and to this end the fewer the stems—provided, of course, that the number is sufficient to properly furnish the receptacle—the better ; it is necessary, too, that the additions of grasses and foliage are moderate, that it shall be clearly apparent that the Sweet Peas are the display, and that the supplementary things are merely put in with a view to enhancing the effect.

CHAPTER IX

CUPID AND BUSH VARIETIES

WE are indebted to America for both of these sections, and it is well within the bounds of possibility that they thrive perfectly in the climate of California and the United States of America ; but they certainly do not flourish here, and they are never likely to become popular.

The Bush varieties are precisely similar in their requirements to the general section, but instead of attaining to a height of anything from 6 feet upwards, they only grow between 3 and 4 feet. If they could be relied upon to give abundant blossoms at that height they would undoubtedly be welcome in the smaller gardens, for the ordinary varieties are rather apt to take up more space than the amateur can properly afford. Unfortunately the Bush plants are not satisfactory in this respect ; therefore they are rarely grown in this country. Some of these days they may be so much improved that they will rival the others in floriferousness, and when that time comes it is safe to predict for them an era of popularity.

The Cupid section is, perhaps, less satisfactory still,

for it is generally easy to grow healthy plants that look as though they would produce thousands of charming blossoms, and then to see all the buds thrown off before expansion ; a little of this sort of thing gets on the nerves of the average Briton, and he resolves to let the Cupids severely alone. Out-of-doors the best place for them is in a hot, sunny situation on a rockery where the roots and stems will be nearly baked, as they will then in a dry season give plenty of flowers. Or if they are grown in pots they must be stood in a position where they will get sun enough to roast them, and afterwards they will sometimes develop all their buds perfectly. Six-inch pots are the most convenient, and each will accommodate six plants ; the soil should be the same as recommended for the ordinary section, but it must not be used in quite as lumpy a state. In any case the general culture of these two groups is not specially recommended ; the grower who tries them should be wary.

CHAPTER X

ENEMIES AND DISEASES

THE Sweet Pea has claims upon the attention of cultivators for many virtues—ease of management, cheapness of seeds, freedom and persistency of flowering, and certainty of satisfactory results if the conditions are favourable—so that if it were afflicted with many and varied enemies and diseases the grower would scarcely be justified in grumbling to any serious extent. Happily, however, it enjoys a freedom from really bad attacks, and, with perhaps one exception, all the troubles which do cause anxiety are such as can be combated without any substantial outlay of money or time. Preventive measures are possible in all instances, and where the necessity arises for the adoption of remedies, then these are such as can be procured and applied without any loss of time or inconvenience. Taking the enemies first, there are, roughly, only four which are generally troublesome, and to three of these attention has been drawn in previous chapters. They are mice, birds, and slugs; the fourth is green fly. Let us briefly refer to each.

There is very little doubt that in many gardens mice are the worst pests of all, since, if they once set to work upon the seeds, they will come in goodly numbers, and the more of the palatable food they can find, the better their appetites will become and the more damage they will do. It is no uncommon thing, when precautionary measures are not adopted, for practically the whole of the seeds sown in pots or boxes in frames and greenhouses to be devoured ; and this means not only loss of seeds, but, what is even more annoying in the generality of instances, loss of time in the production of blossoms. Out-of-doors, too, the visitors will unerringly attack the best varieties, and leave anything that is common or inferior either severely alone, or until they have exhausted the good things of the earth, and are compelled either to go hungry away afterwards or partake of what still remains at their disposal.

Prevention, when the seeds are sown under glass, is simplicity itself ; a square of glass placed over each pot or box will keep the small marauders safely at bay. The danger lies up to the stage of germination, and not beyond it, and if we can protect the seeds, the plants, as far as mice are concerned, are sure to go along all right. In addition to the glass, traps of any convenient form and make should be kept set, as it is desirable not only that the mice should be stopped from attacking the seeds in the boxes, but also from going abroad again and taking toll

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of those that are in the ground out-of-doors. In gardens where mice are numerous all seeds should be thoroughly coated with red lead prior to sowing, as the mice do not like this ; several traps ought always to be set in and near their haunts ; and in case of necessity sharp cinders may be freely mixed in the soil. This course is not, however, altogether desirable, because, although they may do good in the way of checking mice from devouring the seeds of Sweet Peas, cinders are not invariably advantageous in the culture of other crops ; and as the Sweet Peas are usually planted on fresh quarters each season, they may become something of a nuisance. Should it become a matter of the first importance, owing to the depredations, then the cinders must go in, since Sweet Peas are assumed here to be the principal crop of the garden.

After the seedlings show through the surface of the soil there will be two enemies awaiting the delectable morsels, and these are slugs and birds. Of these the slimy slug is indisputably the worse with which to deal. Trapping with small heaps of brewers' grains or other bait is good, but it will not catch all the depredators. Hunting must be made a daily pastime, and should be followed up with all the enthusiasm that such a worthy cause deserves. Applications of salt are prompt in their effects, and there is no fear that the slug that has been completely covered with this will do any further harm

PLATE VI
CLARA CURTIS



either among Sweet Peas or any other plants. Ridges of lime placed down each side of a row or encircling a clump are regarded as wonderfully good, and for the few hours that lime so exposed remains alive, all well and good ; but its virtues are not lasting, and the slugs are quite intelligent enough to know when they can work freely in it. If lime is relied upon, it must be scattered among the plants at frequent intervals, and will then be found a useful deterrent ; the same may be said for soot, but this must not be used in a fresh state or it will destroy quite as many plants as the slugs themselves, and the remedy becomes as bad as the disease. Another excellent method of attacking slugs is to dress the soil, in strict accordance with the instructions given by the manufacturers, with one of the several soil fumigants that are now upon the market. Neither slugs, nor any other pest that lurks in the ground, likes this treatment, and provided that the instructions are rigidly observed, the plants will not suffer from the applications ; on the contrary, marked benefit can often be directly traced to them, apart altogether from the fact that they destroy the enemy.

Coming now to the birds, with their voracious appetites, it may be said at once that prevention is the only cure. If the young plants are left exposed, whether they are growing in frames or the open ground, the birds will get all the food they can from them. It has already been said

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that the topping of the plants once will not materially affect them, unless it be in a beneficial direction, but to allow them to be repeatedly attacked is to court disaster. It is, however, comparatively easy to prevent injury as far as the young plants are concerned ; when it comes to keeping sparrows from picking off the buds the story is a different one, and the preventives are not as obvious. In regard to seedlings, there are wire guards on the market which answer admirably when placed over the lines ; or the cultivator may safely rely upon home-made guards of wood at each end of the rows from which strings or stout thread are closely strung.

Birds should be kept from the plants in frames by having a light framework of fine-meshed, galvanised wire netting made the exact size of the light, and when the latter is off, as it is frequently, the netting must be in use. It must not be forgotten, even for half-an-hour, or much injury may be done. The netting will not interfere with the progress of the plants, since it does not prevent the free admission and circulation of air, and it scarcely breaks the rays of light.

The last enemy with which we have to deal is green fly. When this pest becomes comfortably established on the plants it will need all the grower's patience and perseverance to exterminate it ; but it should never be allowed to settle itself so firmly. If a close look-out is kept at all stages of

growth, and every fly that is seen is promptly destroyed, the trouble will be lessened materially. It multiplies with extraordinary rapidity, and the descendants of one or two pairs become a crowded city in a week. When the numbers are considerable, dusting with tobacco powder or snuff, or syringing with a solution of either tobacco or paraffin, will do good ; but it is far better not to wait until these drastic measures are necessary.

A useful solution of tobacco can be made by soaking 2 ounces of strong shag tobacco in one gallon of water. To make a paraffin solution, boil 4 ounces each of soft soap and quassia in separate vessels ; put the liquors together in about a gallon and a half of water, place on the fire, and when the whole lot is boiling furiously, remove the pot, put in a wineglassful of paraffin, and stir vigorously ; the working in of the oil when the water is boiling hard will go far to ensure perfect amalgamation. All applications of either of these washes are best made in the evening after the sun has gone down, but this is not essential, provided that the mixing is thorough and that no raw paraffin is floating about. The syringe or sprayer used must be one capable of throwing a fine film, not only because this is more economical, but also because it is far more efficacious. Thrips occasionally attack the points of the shoots, and must be destroyed by hand picking.

The great scare in regard to diseases of Sweet Peas is

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streak. What it really is, or whence it comes, no one has any clear idea ; or if they have they are keeping the knowledge to themselves. Streak is not one half as prevalent as the alarmists would have us believe. Directly a man finds a plant yellowing a little at the base he decides that it is streak, whereas it is far more likely to be ordinary Pea mould, or even failure, for which no reason can be found, but which is, generally speaking, more prevalent in old, thoroughly cultivated garden soils which have been manured year after year with natural manures and have gradually become overstocked with humus.

There is undoubtedly a condition known as streak, but so long as it remains in its present stage growers have no cause to worry. It will destroy odd plants, but if these are pulled up as soon as they are seen the grower will not suffer very great loss. Those who do not understand the difference between streak, mould, or yellowing need not give themselves a moment's anxiety in the matter. The thing is to pull up and burn the plant in any case, for the simple reason that the mould is difficult, and often impossible, to cure ; the yellowing is not a disease in the strict sense of the word, and cannot be cured ; while nothing being known about streak, it is obviously impossible for the cultivator to take any effectual remedial measures.

If the enemies and diseases which attack Sweet Peas were as numerous and varied in character as those that pay

STREAK AND FUNGUS MOULD 79

their unwelcome attentions to many other plants the trouble might become a real one, but up to the present it is nothing. Of course, the man who has mould, or yellowing, or who suspects streak will adopt preventive measures, and the most effectual is to change the position of the plants, putting them as far away from the infested area as possible in the following season. He will supplement this by generous dressings of lime, spreading it on the surface to a depth of half an inch or thereabouts, and after a week or ten days pricking it into the ground. This will destroy the spores of any fungi with which it may happen to come in contact, and will at the same time sweeten and immensely improve the fertility of the soil. The genuine streak, it may be of interest to note, runs in clearly defined, dark lines up the stems, but at a certain stage of mould the resemblance of this disease is very close.

CHAPTER XI

FIFTY STANDARD VARIETIES

THE increase in the number of varieties is such that there are somewhere between 500 and 600 which are possibly obtainable. Not a single grower knows all of these, and probably not one of them desires that knowledge. Hundreds have been superseded by later introductions of superior merit, while among others the differences are so slight, that only those who are especially desirous of seeing them can find them ; the ordinary individual, even if he be a whole-souled enthusiast, may have a dim idea that the two similar flowers are not identical, but he cannot say definitely where the difference is or of what it consists.

The raiser of new varieties finds many swans ; the grower who purchases them finds many geese, and wretchedly poor ones at that. The buyer blames the distributor for putting inferior varieties upon the market ; the distributor blames the buyer for insisting on getting a constant succession of new names. It is probable that the purchaser is the more to blame of the two, since he will not be contented to grow the same varieties season after season, with an

addition of two or three new ones each year, but must have a dozen or more novelties to keep his keenness up to concert pitch ; the raiser and distributor know that there is the demand, and it is only human nature to try to provide the supply.

All Sweet Pea growers would complain if the supply of novelties ceased ; their introduction is desirable ; but novelties must be either decidedly superior to, or totally distinct from, any varieties already in commerce. Slight improvements or variations which can only be seen under a microscope are not wanted, and they will eventually do far more harm to the flower than they will good, for the simple reason that many amateurs will become tired of paying high prices without receiving reasonable compensation.

The Court of Appeal will have to be the National Sweet Pea Society, which must make itself so strong and so reliable that every one in the Sweet Pea world, no matter whether he dwell in this country, or in any of the British possessions over the seas, or in any foreign country, will accept the Society's decision that this or that novelty from this or that source is absolutely distinct, markedly superior, and thoroughly fixed, and therefore worthy of purchase. When the Society adopts such a policy, some people, being dissatisfied, will threaten to withdraw their support, and the thing will be to let them go. Directly the flood of prosperity sets in it will continue to flow, and for

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each one who falls out a score will fall in ; and later, the malcontents will see that the work is to their interests and will come back into the ranks. Any wavering on the part of the Society from a clearly defined line of straightforward action will contribute to the commencement of its downfall, and when this starts it will not be found easy to stop it. The Society should live as well for the trade grower and distributor as for the amateur, and if it serve both well it will be fulfilling the task for which it was established. Should any one who reads this book not yet be a member of that Society, he ought to become one at once, for he will find the modest fee an excellent investment.

From the immense number of varieties now in commerce, it is no easy task to select as few as fifty and feel able to affirm that these are the best that can be grown. But the task must be attempted, since a complete catalogue, although it may have a certain interest, cannot have a practical value to the man who wants to start a collection, for he would not know which are distinct and meritorious.

In the subjoined selections it may be well to state at once that no variety is mentioned which was not in commerce in the spring of 1910, so that it is safe to assert that all of them will be seen at the exhibitions of the National Sweet Pea and other Societies in parts of the country. The learner may utilise the list as suggestive, and then

seek in the gardens of his friends and at the shows for the varieties recommended, when he will find it a comparatively easy matter to choose those which especially appeal to him in colour and form.

The colour classification of the National Sweet Pea Society will be followed, as this will still further facilitate the subsequent making of selections by individual growers. The impression is steadily but surely growing that the time has come when this scheme requires careful revision and extension, but until this is done it must be accepted as the standard of the Sweet Pea world. Unless it appears to be essential, no descriptions will be appended to varieties; these can be procured from the catalogues either of the Society or the seed merchants.

White.—Etta Dyke. Nora Unwin. * Dorothy Eckford.

Crimson and Scarlet.—King Edward Spencer (under one of its several names). George Stark. Sunproof Crimson (Dobbie's). * Queen Alexandra.

Rose and Carmine.—John Ingman. Marjorie Willis.

Yellow and Buff.—Clara Curtis. * Mrs. Collier. Paradise Ivory.

Blue.—A. J. Cook. * Lord Nelson.

Blush.—Mrs. Hardcastle Sykes.

Cerise.—* Chrissie Unwin. Coccinea Spencer (under one or other name).

Pink.—Countess Spencer. Audrey Crier.

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Cream Pink.—Constance Oliver. Mrs. Hugh Dickson.

Orange Shades.—Helen Lewis. Maggie Stark. * St. George. Up to the present both the beautiful Earl Spencer and the glorious Nancy Perkin are classed in the orange shades, but it does not quite meet the merits of the case, since both are absolutely distinct from any other variety in commerce. It is possible that there will be two strains of Earl Spencer, one waved and the other plain; the former should be chosen and the latter regarded as untrue.

Lavender.—Frank Dolby. Masterpiece. * Lady Grisell Hamilton. Lavender George Herbert.

Violet and Purple.—Rosie Adams. Mrs. Charles Mander. * Duke of Westminster.

Magenta.—Menie Christie. * George Gordon.

Mauve.—The Marquis. * Mrs. Walter Wright.

Maroon and Bronze.—* Black Knight. Black Knight Spencer. * Dudley Lees. Prince of Asturias.

Picotée Edged.—Evelyn Hemus. Elsie Herbert.

Striped and Flaked, Red and Rose.—Aurora Spencer. America Spencer. * Jessie Cuthbertson.

Striped and Flaked, Purple and Blue.—* Prince Olaf. * Marbled Blue.

Fancy.—* Sybil Eckford.

Bicolor.—Mrs. Andrew Ireland. Apple Blossom Spencer. * Jeannie Gordon.

Marbled.—* Helen Pierce.

The order in which the names are given in each colour is not necessarily that of merit. Those varieties marked with an asterisk are plain, while all the others have more or less waved standards and wings. It may be accepted that, with one or two exceptions, all of these are quite distinct, but those who desire to limit their collection to varieties which are perfectly dissimilar, and to have a representative of each colour group, might do worse than make a start with the following sorts and improve upon it according to their individual tastes : Etta Dyke, King Edward Spencer, John Ingman, Clara Curtis, A. J. Cook, Mrs. Hardcastle Sykes, Chrissie Unwin, Countess Spencer, Mrs. Hugh Dickson, Helen Lewis, Asta Ohn, Menie Christie, Rosie Adams, The Marquis, Black Knight, Evelyn Hemus, Aurora Spencer, Prince Olaf, Sybil Eckford, Mrs. A. Ireland, and Helen Pierce. Practically the whole of these have the additional recommendation of almost complete fixity, so that the grower may feel assured of growing the colours which he anticipates from the descriptions.

CHAPTER XII

IN THE LIBRARY

A FEW years ago there were no books wholly devoted to the Sweet Pea, except those which were more in the form of catalogues published by one of the great Californian seed-growers. But the institution of the National Sweet Pea Society changed all that.

It is to the Society's credit that it was the first to issue a book on the Sweet Pea ; this was the report of the Bicentenary Celebration held at the Crystal Palace in 1899. After a short interval the Society commenced to issue its *Annual*, intended to foster a love of the flower, and to widely distribute information in reference to cultural matters and varieties. These issues were followed in rapid succession by others from private sources. For the complete list that is given below we are mainly indebted to Mr. C. Harman Payne's *Florist's Bibliography*.

The Report of the Sweet Pea Bicentenary. Published by the National Sweet Pea Society, and now probably unprocurable.

The Sweet Pea Annual, 1905, -6, -7, -8, -9, and -10. Edited by Horace J. Wright and Charles H. Curtis, and published by the Society. Free to members and affiliated Societies. Issued to the public at 2s., post free.

Sweet Peas and their Cultivation. By Charles H. Curtis. Published by W. H. & L. Collingridge. Price 1s. in paper boards, and 1s. 6d. in cloth.

The Culture of Sweet Peas. By Richard Dean. Published by the Agricultural and Horticultural Association. Price one penny.

The Sweet Pea. One of the series of Horticultural Handbooks issued by *Hobbies*.

How to Grow Sweet Peas. By Thomas Stevenson and W. F. May.

All about Sweet Peas. By Robert Sydenham. Published personally. Price 6d.

Sweet Peas and How to Grow Them. By Harry H. Thomas. Published by Cassell & Co. Price 1s. in paper boards, and 1s. 6d. in cloth.

A Second Account of Sweet Peas. By A. P. Wyman and M. G. Kains. Bulletin 127 of the Cornell University, Horticultural Division, Ithaca, N.J.

Culture and History of Winter Flowering Sweet Peas. By Anthony C. Zvolanek.

Book about Sweet Peas. By Walter P. Wright. Published by Headley Bros. Price 2s. and 2s. 6d.

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The Book of the Sweet Pea. By D. B. Crane. Published by John Lane. Price 2s. 6d.

Sweet Peas Up-to-Date. By G. W. Kerr. Published by W. Atlee Burpee. U.S.A.

Les Pois de senteur. By G. D. Clark, Dover. Published personally.

CHAPTER XIII

CULTURE OF SWEET PEAS FOR EXHIBITION

BY THOMAS STEVENSON

IN considering the subject of Sweet Peas for exhibition, I am led to recall the circumstances of ten years ago. At that time there certainly were classes for Peas at some of the leading shows, but the exhibitors did not treat the matter very seriously; nor was it difficult to win prizes. Even to-day the prizes are never very high, nor are there large numbers of classes, but Sweet Pea growers are so enthusiastic that the classes are well filled and Sweet Peas occupy at least one-third of the space devoted to cut flowers, and far outclass any other individual flower, not excepting the Rose. All the time the exhibition is open an enthusiastic crowd may be seen round the exhibits, discussing the merits of each variety. This is not all, for when travelling to or from the city by tram, train, or 'bus, one can again hear the merits of every variety discussed, not by one, but by scores of men, who seem to have only one end in view, namely, the exhibiting of Peas. It may not be in large, open competitions, but just a friendly affair arranged

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by members of one firm, or possibly the clerks in one office ; there are scores of these competitions held in London alone. It is this class of exhibitor that the present chapter may benefit more than any other, for such growers are always anxious to improve their knowledge whereby they can gain a point or two at future exhibitions.

In order to be successful in exhibiting Sweet Peas, as in all other things, a certain amount of time and thought is absolutely necessary, and nothing from start to finish must be performed in a perfunctory manner. Method, hard work, and attention to the smallest detail must be practised by every one who would attempt to follow in the footsteps of such men as Jones, Malcolm, Cole, Hopkins, and Usher. These giants would tell you that their plants are given daily, yes hourly, attention from the day the seeds are sown to the time the haulm is pulled up and burnt after harvesting the seeds.

Seed Sowing.—There are various dates and methods recommended for sowing the seed of Sweet Peas, some favouring one time and some another. Many exhibitors sow out-of-doors in autumn, and in gardens where the soil is of a light nature and exceptionally well drained this method succeeds admirably. Others sow in pots in autumn, and winter the young plants in cold frames ; while still others sow the seeds in spring, either in pots or in the open ground. By each method success may be obtained. Before deciding which system is best to adopt there are

PLATE VII
SUNPROOF CRIMSON



many things to be taken into consideration, such as the locality, whether in the northern or southern counties ; whether the soil is light and warm, or cold and heavy ; and lastly, what are the dates when the flowers will be required to be at their best.

From observations made during a number of years on light and heavy soils in both dry and wet seasons, I have come to the conclusion that sowing in pots in autumn is by far the best system ; but I would not go as far as to suggest that cultivators should have all their eggs in one basket, as it were, but rather that they should try the two systems, sowing in pots in autumn and sowing in pots in spring. At the same time I have no doubt in my own mind as to which system will give the largest and best-coloured flowers, with good stems, and which plants will continue to bloom for the greatest length of time. Even in 1909, which was anything but an ideal season, the autumn-sown plants commenced blooming early, giving flowers larger, stronger, and better able to withstand ungenial weather than those sown in the spring, and they flowered freely until the end of September. Plants raised in autumn and kept hardy all the winter make a greater proportion of roots than top growth. The roots are very hardy, and when planted out early in April quickly take hold of the soil and develop young roots, which are not by any means so tender and susceptible to cold as the softer roots of

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spring-sown plants, so that growth from the outset is more vigorous and hardy. For autumn sowing in pots, seeds must be obtained early from the seedsmen, as they should be sown by the middle of October. A fairly light compost should be prepared consisting of loam and leaf-mould, and a little sand to keep it porous; the addition of bone meal, say a 5-inch potful to a wheelbarrow load of the compost, will not be detrimental, though it is not really necessary. The one aim should be to keep the plants as sturdy as possible. Pots 5 inches or 6 inches in diameter are the best to use, and they should be filled to within $1\frac{1}{4}$ inches of the rim with the compost, pressing it only moderately firm. Five or six seeds may be put round the sides of the 5-inch pot, while eight or nine may be put in a 6-inch pot. Some of the larger and harder seeded varieties should be chipped before sowing with the point of a knife (be careful not to injure the interior), to induce them to germinate quickly. I have found seeds of Elsie Herbert quite hard and sound after being sown for two or three months, and which afterwards pushed through the soil in a very few days after having a little of the hard skin removed. Cover the seed over with soil, and place the pots in a cold frame, after which a thorough soaking of water must be applied. Place the lights on the frame, and keep it moderately close until the young plants appear through the soil, when air must be given freely, and as the

plants get harder the lights may be removed entirely on fine days, but not before taking the precaution to put an old fruit net over the frame, or there will be trouble with the birds. I ought to have said that at the time of sowing the seeds a few small pieces of bread-and-butter should be coated with phosphorus paste and placed about among the pots to poison mice that may be present. Prevention is better than cure in such cases. After the plants are nicely up and in leaf the lights should only be put on in the event of very wet or frosty weather. In cases of prolonged frost or snow it will be wise to cover the frames with mats, but do not coddle the plants too much ; take the mats off every day and admit air, if only for an hour or two. A little frost will not hurt the plants when they are moderately dry at the root ; therefore the necessary watering should be done as much as possible when the weather is mild.

Spring sowing in pots should be done in February, and as February is an unusually cold month it will be best to place the pots on a shelf in a cool house until the plants are through the soil, when they may be taken to a cold frame and treated similarly to the autumn-sown plants, adopting the same precautions against mice, slugs, birds, and frost.

Where a fairly large quantity of plants is required, say from three to four dozen of one variety, boxes may be employed in place of pots, and they can be handled with

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greater convenience. The boxes should be from 4 to 5 inches deep, and the seeds should be placed about 2 inches apart, covering them with $\frac{3}{4}$ inch of soil. They will germinate even quicker in boxes than in pots, owing, no doubt, to the greater amount of soil and a more equal degree of moisture.

When sowing in pots avoid using new pots, for on one or two occasions I have found when the young roots have come in contact with the sides they have been killed outright (possibly through something that has been used in the manufacture of the pots). This was even after the pots had been soaked for an hour or two in a tank of water before using them.

Sowing Out-of-doors in Autumn.—Only in very favoured localities can this method be practised with any degree of success for exhibition purposes, but where the soil is light and the atmosphere generally fairly dry and free from fog, autumn sowings out-of-doors are usually productive of early flowers. I have not found them quite as early as spring-sown plants—indeed they are sometimes very much later in blooming than those planted out from pots, notwithstanding the fact that the soil and situation are all that could be desired for the purpose. Another point worth consideration is the amount of seed necessary for outdoor sowing, for one must make an allowance of 50 per cent. at the least for the ravages of birds, slugs, mice, and frost. I cannot recommend the adoption of this method except in

cases where the conditions are very favourable ; however, those who wish to try it should have the ground prepared early in September (as will be advised later), so as to sow the seeds at the beginning of October. Many failures occur through the seeds being sown too early, for the plants then get so tall that they are easily injured by frost. Two drills should be drawn from 2 to 3 inches deep, and about 1 foot asunder, placing the seed, which must be coated with red lead, about 2 inches apart in the drills, and covering it carefully with fine soil ; if this is of a very light nature it may be trodden lightly over.

As soon as the young plants appear through the ground they must be dusted over with soot to ward off slugs, and this must be done frequently right through the winter. Wire guards must be put over them to keep off birds ; or benders with fish-netting will answer quite as well.

A keen look-out must be kept for mice, or they will eat the young plants off close to the ground. Pieces of bread covered with phosphorus paste should be put frequently here and there along the rows. Trapping may also be employed, and I have found nothing better than the old figure 4 trap in conjunction with two slates.

When possible the soil must be kept lightly stirred with a small hand-hoe, taking care to have the surface quite fine, as the coarser the soil round the plants, the more harbour there is for slugs.

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As soon as the plants begin to grow in the spring they will require staking, but this matter will be treated of later.

Spring Sowing Out-of-doors.—This is similar to autumn sowing, and may be done in light soils during February, but, generally speaking, early in March is the better time. There is then not much fear of losses by frost, the only critical time being when the seedling is just pushing out its young shoots; then, if the conditions are wet and a severe frost sets in, they are apt to get frozen, but once they pass through the ground any ordinary frost will not injure them in the least. The general instructions given for the autumn sowing apply equally well to this sowing. I have never seen Peas sown out-of-doors, even in spring, grow so strongly or give such good results as those sown indoors and planted out.

Preparation of the Ground.—This work is most essential in the successful cultivation of Sweet Peas, for nothing that can be done afterwards will compensate for neglect in this matter. A few extra hours' work, or an extra load of manure, will be more than repaid by the better results.

In choosing a position for growing exhibition Peas, endeavour to secure a piece of ground that is fairly exposed and which has not grown any leguminous plants for a year or two. If it is sheltered on one or two sides from the cold winds, then so much the better; and a little shade

PREPARATION OF GROUND 99

at some period of the day may not hurt them ; but the ground must not be overhung by large trees, or it will be found that not only will the tops shade the Peas too much, but the tree roots will rob the soil of nourishment required by the Peas. For autumn sowing the ground must be trenched early in September, but for those Peas raised in pots for planting out in the spring it need not be trenched until later. In fairly light soils any time after November will do, as a little consolidation afterwards will not hurt ; but for heavy, retentive soils, which during rains are apt to run together again, the months of January and February provide the best time. The trenching should be done at least three spits deep, and when the subsoil is heavy and close, plenty of opening material, such as leaves, sweepings from the flower-garden, wood-ashes, and old lime rubble, may be worked in. Do not put the materials in layers, but incorporate them with the soil. In the bottom and second spit plenty of good, rich manure should be utilised. Manure from the cow-yard or bullock pens is very good, or, if it could be procured from a butcher who kills his own cattle and throws the blood over the manure heap, this will be better still, and will not need to be used in quite such large quantities. Failing these, however, ordinary stable manure will answer admirably ; but neither must be left in layers in the trench, for once the roots get into large quantities of it they will stay

there, instead of going further afield. Then the growth will be sappy, and will fail just at a critical time, and we shall hear of another bad attack of streak, or some such disease. Neither must this strong manure be brought nearer than one foot to the surface of the soil. In the top spit a little bone-meal, soot, and wood ashes may be worked, and during the operation all the soil must be thoroughly well broken up with the spade or fork, not leaving it in large lumps, as the finer the soil the more likely are the roots to ramify in it; and in this free root action lies the great secret of success.

It is a practice with some people when trenching to bring the bottom spit to the top, and when the soil has been trenched a number of times it may answer well; but if the subsoil is very heavy and clayey it is best to leave it underneath, and put plenty of leaves and other opening material with it for a year or two, when it will be in a better condition for sowing or planting. Generally speaking, after skimming the surface, and putting this in the bottom of the trench, it is better to keep the top spit on the top, although this will cause a little more labour when trenching.

As the trenching operation proceeds, apply a good sprinkling of lime over the surface; this will tend to sweeten the soil, as well as make it more workable. On very heavy soil ridging may be done even after trenching, thus exposing a large amount of soil to the action of the weather. When

the time comes for planting, these ridges, broken down, will provide a good amount of dry soil for planting in or for sowing seeds, whichever is wished.

Planting.—If the young plants have been hardened off, and the soil is in a proper workable condition, the autumn-sown plants may be put out any time after the middle of March, and the spring-sown ones as soon after as possible. Make quite sure first that the plants are hard in the stem by exposing them to plenty of air. A day or two before planting, the surface of the soil should be lightly forked over and a little superphosphate worked into it.

For exhibition purposes Sweet Peas ought to be planted in rows, and if these extend from east to west those varieties that require shading will only need it on one side of the row. When planting, endeavour to put all such varieties as near together as possible. For economy of space planting should be done in double rows, 1 foot apart, allowing about 1 foot from plant to plant; and if 6 feet can be allowed from centre to centre of each pair of rows this will be ample, but if the cultivator is pushed for space a distance of 5 feet will suffice. Shake out each plant individually, taking care not to damage the roots; make a good hole, and spread the roots out carefully; press the soil well around them, and be particularly careful around the collar of the plant. Next give a thorough sprinkling of soot. It will be found that the autumn-sown plants will require some

support immediately after planting ; small twigs of birch placed round each plant will keep them from toppling about, and shelter them somewhat from the wind.

Spring-sown plants will naturally be somewhat shorter than the others, and may not require staking until two or three weeks have elapsed ; but if sticks or twigs are at hand it is just as well to do them right away, and it will save treading the ground over twice. If the plants have been properly hardened previous to planting, there is not the slightest fear of injury by frost, as I have known instances of from 15° to 20° of frost the night after planting, and still the plants have not suffered ; the worst injury is not caused by cold, but by wet weather and easterly winds. After placing the short stakes, fork the ground over lightly between the rows, and spread an old fish-net over the whole patch ; this will protect the plants from birds and the wind.

If planting in clumps is preferred, each clump, of about five or six plants, should not be less than 4 feet apart each way, to allow plenty of room for staking and for getting about among them. Other cultural conditions will be exactly the same as for plants in rows.

When the planting is done there will not be much else needing attention for some little time, but strict observations must be maintained, and applications of soot made to keep slugs from injuring the plants. Wireworm may cause

PLATE VIII
MASTERPIECE



a plant or two to die, and vacancies of this kind should be made good, but not before the enemy has been found and killed.

Staking.—When the plants are from 9 inches to 1 foot high staking should be done, and this is a task that necessitates some little trouble. A few years ago one just staked Sweet Peas as an ordinary row of culinary Peas, but now that more trouble is taken in thinning the bine or haulm, staking has to be done accordingly. I know no better method than putting a strong pole at the end of each row, with one in the centre if a long row, with cross-pieces, one about 3 feet up and the other 7 to 8 feet. To these cross-pieces strain a wire from end to end, and then use long hazel stakes, inclining them towards the wires, and placing a tie here and there to make them tidy and flat. By inclining the tops of the stakes inwards, and training the plants on the outside of these, all the flowers will develop freely, and not come deformed, as many of them do, if allowed to grow up anyhow between the stakes. This method entails much extra labour, but it results in the flowers having good, strong, and straight stems, which are easy of arrangement when they are brought to the exhibition.

For supporting clumps it is a good plan to make a strong wire hoop, or a twisted hazel will do, any size that is required. To this the tops of the stakes can be tied,

and it will keep them firm and prevent them being blown about by strong winds.

Thinning.—It will be found that autumn-sown plants will break out pretty freely from the base, quite close to the ground, and if the centre shoot does not appear to be growing away kindly, cut this out, and take up two or three of these basal shoots, but do not on any account overcrowd them. When they are between 18 inches and 2 feet high, bring the shoots to the outside of the stakes as advised, and give a tie here and there to keep them in position. This also applies to the spring-sown plants, except that the main shoot in this case is sure to grow away freely, and it is only necessary to supplement these according to the space to be filled. One shoot every 4 or 6 inches is quite close enough. As the plants make growth, keep the ground hoed and apply soot at least every fortnight; this will stimulate the plants as well as protect them. Beyond the shoots mentioned, keep all side growths pinched out and tie the leaders as often as necessary; but if good, bushy, hazel sticks are used the tendrils will lay hold of them well, so that the tying will not be a very formidable task.

Mulching, Feeding, and Watering.—The practice of mulching Sweet Peas heavily with strong manure as soon as they are staked is not to be recommended. At the time of staking a sprinkling of well-decayed manure or leaf-mould

may be given between the two lots of plants forming the rows, also for about 6 inches on either side, but beyond this I do not believe in it unless there is very protracted dry weather. Hoeing has effects quite as good ; it keeps the plants steadier, and does not tend to make them sappy, as is the case with a heavy mulch. In heavy soils it takes a long time for the sun to thoroughly warm the ground, and unless it is thoroughly warm, good-quality Peas cannot be obtained from it. Therefore do not mulch the rows until flowering has well commenced and there is hot, dry weather. On lighter soils mulching may be done earlier, but on either class of soil choose moss litter or a mulch of light manure, such as fairly fresh horse-droppings mixed with leaf-soil, rather than heavier material. This mulch can be hoed over in much the same way as the soil, but after it has been on some time and the plants are doing well, roots will be found running very freely among the manure. The hoeing must then cease, and a little more material may be added, but do not on any account use short grass-mowings except in very small quantities, for in wet weather they form a slimy mass and hinder the air from getting to the roots.

Sweet Peas are gross feeders, but if the soil is thoroughly well tilled and manured they do not like too much manure afterwards, for if the roots can find plenty of food in their journey downwards the plants will keep very strong for some

time after they have commenced to bloom. If, however, they require feeding, give them farm-yard liquid manure about once a week, alternated with waterings of clear water, this latter only in the event of dry weather. Do not use artificial manures as a regular thing, but rather rely on them to give a little extra stimulus just previous to a show, and one or two waterings will generally suffice. Nitrate of soda, nitrate of potash, and sulphate of ammonia can each be relied on to give an extra fillip to the plants, provided that the ground has been properly manured before planting. Either of these should be used two or three weeks before a show, and if the weather is wet a slight sprinkling may be given to the ground on each side of the rows, but if dry it is as well to use it in the water at the rate of $\frac{3}{4}$ lb. to 50 gallons of water.

On dry, porous soils, after the plants are well in bloom, they will appreciate any quantity of water, and much more manure than on heavy ground. On heavy land great care must be exercised, for an extra dose of either manure or water will tend to make the buds drop, and the blooms that do open will be thin and of a poor colour. Therefore, in either feeding or watering, try to be guided by the requirements of the plants, and err rather on the under side than the reverse.

Preparing and Cutting the Blooms.—Many people remove all bloom buds as they appear until about a fortnight

or so before the exhibition. This may be wise, but I hardly think so, particularly if the plants are in vigorous health, for good colour and refinement in the flower are desirable qualities; extra coarse stems, with the blooms straggling here and there at varying distances apart, are not the only, or, indeed, the best qualities. By allowing the plants to bloom, and cutting the spikes when the first flower is open, it will not unduly exhaust the plant, but it will prevent coarseness of flower and the tendency of the colour to run and streak; the stems also become firmer and have not the same tendency to hang their heads when set up in a warm tent.

Unfortunately, there are a few varieties that cannot withstand the sun, such, for instance, as the orange-shaded flowers and one or two of the crimson and scarlet varieties; but, nevertheless, they do not require much shade. I have seen various things tried for shading purposes, but nothing answers so well as old fish-nets, three or four thicknesses, and placed well away from the plants. If this is put on three clear days before the show it will prove quite sufficient, but it must be removed again when not required, though this is really not so imperative as when tiffany is used; this latter material excludes much air as well as light, and on really hot days the blooms will scald from want of air as badly as they would burn by the sun.

In cutting flowers for the show the exhibitor must be

guided somewhat by the prevailing weather conditions, but, generally speaking, they should be placed in water for five or six hours before being packed for travelling. If the weather is dry, try to cut the flowers on the evening before the show, but not after dew has commenced to fall. Place them in water in a dry, airy shed, and give the blooms plenty of air space between them. If wet weather prevails, then cut the flowers several hours earlier, and place them in vases or jars in a house where there is just a trifle of heat, giving plenty of air. They will be found to dry fairly quickly if treated in this manner, and, packed carefully, I have seen them come up fresh and unmarked after twenty hours in the hampers.

Packing for Transmission to Show.—Many methods are employed for carrying the flowers, but flat hampers about 5 inches deep are far and away the best. They hold one layer of bunches only, so there is no danger of crushing; neither is there much danger of the flowers spoiling through moisture accumulating as it does in boxes. If the weather is very hot and dry, line the basket with waxed paper—this prevents too much evaporation; and if the blooms are wet and the weather damp, then use very soft tissue-paper, and this will absorb a fair amount of the moisture. Immediately on arriving at the show, endeavour to get the flowers unpacked and placed in water. If this can be done four or five hours before judging commences,

SHOWING THE FLOWERS III

the blooms will have every opportunity of looking their best. If they have been cut fairly young they will grow considerably after being put in water.

Setting up the Flowers.—It is assumed that more blooms will be taken to the show than are actually required; but do not overdo this. Choose the cleanest sprays with at least three flowers on a stem, and endeavour to place each bloom so that it stands quite apart from its neighbour; a crowded vase generally gives the judge an impression that there is something to hide.

In arranging the vases on the table, try to give each row a fall of about 6 inches from the one behind it, and place the colours nearest together that form the most pleasing combinations, not relying too much on harsh contrasts, but at all times endeavouring to get as many distinct shades into the collection as possible.

See that each vase is correctly and legibly named, and make a point of carefully looking over them to see that no stray bloom has crept into a vase, or disqualification will result. In the event of your exhibit not obtaining the award looked for, do not forget that the judges have not the biased view of things you are likely to have; they invariably do their best.

Varieties for Exhibition.—Do not grow too many varieties, and do not actually depend on a new variety for exhibition until you have tried a clump or two to satisfy

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yourself as to its merits and as to the percentage of rogues it is likely to contain.

A few sorts that can be thoroughly recommended as the very best in their colours are :—

Nora Unwin and Etta Dyke, Sunproof Crimson (Dobbie) and King Edward Spencer, John Ingman and Marjorie Willis, Clara Curtis and Paradise Ivory, Kathleen M'Gowan and Zephyr, Mr. Hardcastle Sykes, Countess Spencer and Audrey Crier ; Mrs. Henry Bell and Constance Oliver, Helen Lewis and Maggie Stark, Rosie Adams, Frank Dolby, and Masterpiece, Lavender George Herbert, Menie Christie, America Spencer, Evelyn Hemus, Elsie Herbert, Prince of Asturias, Black Knight Spencer, The Marquis and Mrs. Andrew Ireland.

A few new ones that ought to be tried as soon as they are procurable are Florence Wright, Holmes's Sunproof Crimson, Rosabel, Charles Foster, Syeira Lee, Edrom Beauty, Earl Spencer, Nancy Perkin, Silas Cole, Mrs. W. J. Unwin and A. Unwin.

CHAPTER XIV

A WORD OR TWO TO JUDGES

BEFORE undertaking the onerous duties connected with judging, be quite sure you have an intimate knowledge of the varieties, so as to be able to discriminate between two or more varieties that are nearly alike. Endeavour to see if there are any of these mixed together in one vase ; then judge the different vases on their merits, and do not be biassed in favour of or against any particular variety. Sweet Peas of good colour, form of flower, with fair length of stem, should be placed before flowers that are coarse and of poor colour. Crowding in the vases should be rigidly discouraged, for where this occurs there are usually poor blooms that require hiding—possibly stems with only two flowers on each. Where two or more collections are very nearly equal, preference should be given to an exhibit that contains the largest number of distinct colours, as apart from different shades of one colour. In cases where collections, for some cause or another, have to be disqualified, do not hesitate to put on the card why such a course has been adopted ; it will teach the exhibitor what to avoid in the future.

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